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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,415	07/26/2002	Stephen Little	P282677	3801

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EXAMINER	
CHAKRABARTI, ARUN K	

ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 01/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/889,415	Little
Examiner	**Art Unit**
Arun Chakrabarti	1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Nov 26, 2003*.

2a) ☐ This action is **FINAL.** 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above, claim(s) *1-5, 15, and 16* is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *6-12 and 14* is/are rejected.

7) ☒ Claim(s) *13* is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☒ All b) ☐ Some* c) ☐ None of:

1. ☒ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. *09/889,415*.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). *1103*
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Detailed Action*

DETAILED ACTION

Election/Restriction

1. Applicant's election without traverse of Group II, corresponding to claims 6-14, in Paper dated November 26, 2003 is acknowledged.

Specification

2. The spelling "hybridisation" in claims 6, 10, 13, and 14 are incorrect. The spelling "unhybridised" in claim 6 and "hybridised" in claim 10 are also incorrect. The spelling "chracterised" in claim 6 and "immobilised" in claim 14 are also incorrect. Proper corrections are required.

Claim 13 is objected to under 37 CFR 1.75© as being in improper form because a multiple dependent claim 13 cannot depend on another multiple dependent claim 12. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 6 and 10-14 are rejected under 35 U.S.C. 103(a) as being obvious over Urdea et al. (U.S. Patent 5,849,481) (December 15, 1998) in view of Mitsuhashi et al. (U.S. Patent 5,639,612) (June 17, 1997).

Urdea et al teaches a method for identifying the presence or absence of one or more test nucleic acid sequences in a sample (Abstract and claims 1-5), comprising:

(I) contacting a nucleic acid containing sample with a plurality of single stranded targeting polynucleotide molecules under suitable hybridization conditions to ensure hybrid formation between the targeting nucleotide portion of the targeting polynucleotide molecule and its complementary target nucleic acid sequence in the sample, each of the targeting polynucleotide molecules possessing, in addition to the targeting nucleotide portion, a unique single-stranded

oligonucleotide tail sequence complementary to a unique capture oligonucleotide sequence attached to a solid support (Column 10, lines 10-49);

(ii) optionally separating the unhybridised targeting polynucleotide molecules from the hybrid molecules (Column 10, lines 10-49);

(iii) contacting the population of hybrid molecules to a solid support having attached thereon at pre-defined locations unique capture oligonucleotides, each capture oligonucleotide being complementary to one or other of the oligonucleotide tail sequences on the targeting molecules, under suitable conditions to ensure capture of each of the hybrid molecules to the solid support (Column 10, lines 10-49); and

(iv) determining the presence or absence of the captured hybrid molecules at each of the pre-defined locations on the solid support (Column 10, lines 10-49).

Urdea et al does not teach a method, characterized in that substantially all of the oligonucleotides possess substantially the same Tm when bound to their complementary sequence on the tail.

Mitsuhashi et al. teach a method, characterised in that substantially all of the oligonucleotides possess substantially the same Tm when bound to their complementary sequence on the tail (Column 14, lines 20-46). Mitsuhashi et al also teaches a method to easily calculate Tm of any hybridized complex of oligonucleotides and select any required Tm of choice.

Urdea et al does not teach a method for quantifying the expression level of a gene comprising:

I) converting mRNA from a test sample into cDNA;

ii) optionally, fragmenting the newly synthesized cDNA into appropriate length nucleic acid fragments.

Mitsuhashi et al. teach a method for quantifying the expression level of a gene comprising:

I) converting mRNA from a test sample into cDNA;

ii) optionally, fragmenting the newly synthesized cDNA into appropriate length nucleic acid fragments (Column 2, lines 4-10).

Urdea et al does not teach a method, wherein each target gene is detected by a plurality of targeting polynucleotides that bind at distinct parts of the target gene.

Mitsuhashi et al. teach a method, wherein each target gene is detected by a plurality of targeting polynucleotides that bind at distinct parts of the target gene (Column 14, lines 35-46).

It would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to combine and substitute the method, characterised in that substantially all of the oligonucleotides possess substantially the same Tm when bound to their complementary sequence on the tail of Mitsuhashi et al. into the sequencing by hybridization of Urdea et al. since Mitsuhashi et al. states, "The present invention provides an improved method of detecting the presence of an organism, an infectious agent, or a biological component of a cell or organism in a biological sample (Column 2, lines 13-16)". An ordinary practitioner would have been motivated to combine and substitute the method, characterised in that substantially all of the oligonucleotides possess substantially the same Tm when bound to their complementary sequence

on the tail of Mitsuhashi et al. into the sequencing by hybridization of Urdea et al. in order to achieve the express advantages, as noted by Mitsuhashi et al, of an invention which provides an improved method of detecting the presence of an organism, an infectious agent, or a biological component of a cell or organism in a biological sample.

Urdea et al. in view of Mitsuhashi et a do not teach the method, wherein there are between 5 and 80 distinct targeting oligonucleotides per target gene.

However, it is *prima facie* obvious that selection of the specific numbers of targeting oligonucleotides represents routine optimization with regard to the size and requirement of the targeting oligonucleotides to be assayed, which routine optimization parameters are explicitly recognized to an ordinary practitioner in the relevant art. As noted *In re Aller*, 105 USPQ 233 at 235,

> More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.

Routine optimization is not considered inventive and no evidence has been presented that the selection of the specific numbers of targeting oligonucleotides was other than routine, that the products resulting from the optimization have any unexpected properties, or that the results should be considered unexpected in any way as compared to the closest prior art.

5. Claims 6-14 are rejected under 35 U.S.C. 103(a) as being obvious over Urdea et al. (U.S. Patent 5,849,481) (December 15, 1998) in view of Mitsuhashi et al. (U.S. Patent 5,639,612)

(June 17, 1997) further in view of Old (Methods in Molecular Biology, US, (1991), Vol. 9, pages 77-84).

Urdea et al. in view of Mitsuhashi et al. teach the method of claims 1 and 10-14 as described above.

Urdea et al. in view of Mitsuhashi et al. do not teach the method, wherein the targeting polynucleotides are amplification refractory mutation system (ARMS) primers and wherein each primer is used in conjunction with a second companion primer to amplify the target region of interest.

Old teaches the method, wherein the targeting polynucleotides are amplification refractory mutation system (ARMS) primers and wherein each primer is used in conjunction with a second companion primer to amplify the target region of interest (Abstract, Figure 1, and Design of Primers Subsection, and Methods Section).

It would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to combine and substitute the method, wherein the targeting polynucleotides are amplification refractory mutation system (ARMS) primers and wherein each primer is used in conjunction with a second companion primer to amplify the target region of interest of Old into the sequencing by hybridization of Urdea et al. in view of Mitsuhashi et al., since Old states, "The amplification refractory mutation system (ARMS) is a simple and rapid method of detecting point mutations, restriction fragment length polymorphisms (RFLPs), and small nucleotide insertions or deletions (Abstract, first sentence)". An ordinary practitioner would

have been motivated to combine and substitute the method, wherein the targeting polynucleotides are amplification refractory mutation system (ARMS) primers and wherein each primer is used in conjunction with a second companion primer to amplify the target region of interest of Old into the sequencing by hybridization of Urdea et al. in view of Mitsuhashi et al. in order to achieve the express advantages, as noted by Old, of an invention which provides simple and rapid method of detecting point mutations, restriction fragment length polymorphisms (RFLPs), and small nucleotide insertions or deletions.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arun Chakrabarti, Ph.D., whose telephone number is (703) 306-5818. This phone number will be changed to (571)272-0740 on and from January 14, 2004. The examiner can normally be reached on 7:00 AM-4:30 PM from Monday to Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion, can be reached on (703) 308-1119. The fax phone number for this Group is (703) 746-4979. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group LIE Chantae Dessau whose telephone number is (703) 605-1237.

Arun Chakrabarti,

Arun Kr. Chakrabarti

ARUN K. CHAKRABARTI
PATENT EXAMINER

Patent Examiner,

December 16, 2003

Gary Benzion

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